

THE APPLICATION OF ZAMIA PUMILA L.

Lyman B. Smith

In his monograph of the Cycadaceae in the Pflanzenreich (p. 143, 154), J. Schuster reduces Zamia pumila L. to the synonymy of the later Z. furfuracea L. f. and Z. media Jacq. because he considers it a nomen confusum. However, it is confused only insofar as it includes more than one species, a common situation with Linnaean names. There is no confusion about the identity of the two species involved, and under the International Code of Nomenclature it only remains to determine which of the two was first validated or which first reduced to synonymy.

Linnaeus in his original publication of Z. pumila (Sp. Pl. ed. 2. 1659. 1763) cites four references: Miller, Commelin, Plukenet, and Trew. Of these only Commelin belongs to the West Indian species described by Schuster under Z. media and the remainder belong with the Mexican Z. furfuracea.

Schuster accounts for three of the four Linnaean citations, but unaccountably omits any mention of Miller there or later, and it is Miller that settles the question. In the 1768 edition of his Gardener's Dictionary, which is the first to be valid for species descriptions, Miller publishes Palma pumila and cites the same Plukenet and Trew references as Linnaeus but omits the Commelin reference. This action automatically emends the Linnaean species to include the Mexican references and exclude the West Indian.

To make the case complete Aiton published Z. debilis in his Hortus Kewensis and based it on the Commelin citation while omitting the other Linnaean references. The summary of the nomenclature is as follows:

ZAMIA PUMILA L. Sp. Pl. ed. 2. 1659. 1763.

Palma pumila Mill. Gard. Dict. ed. 8. 1768.

Zamia furfuracea L. f. in Ait. Hort. Kew. 3:477. 1789; J.

Schuster in Engl. Pflanzenreich IV. Fam. 1:143. 1932.

ZAMIA DEBILIS Ait. Hort. Kew. 3:478. 1789.

Zamia media Jacq. Pl. Hort. Schönbr. 3:77, pl. 397-398. 1798;

J. Schuster in Engl. Pflanzenreich IV. Fam. 1:154. 1932.

NOTES ON BROMELIACEAE, XVI

Lyman B. Smith

MEXICO

PITCAIRNIA MODESTA L. B. Smith, sp. nov.

A P. tuerckheimii Donn. Smith, P. hintoniana L. B. Smith atque P. leprosa L. B. Smith quibus affinis, bracteis florigeris magnis, floribus reflexis, sepalis acuminatis densissime ferrugineo-lanatis differt.

Stemless, flowering 9 dm. high; leaves many in a dense pseudobulb; sheaths suborbicular, dark brown, sublustrous, glabrous; blades dimorphic, some reduced to dark brown flat retrorsely serrate spines, others green, deciduous along a straight transverse line, serrate below the line, unknown above but presumably like the larger scape-bracts; scape erect, ca. 1 cm. in diameter at base, densely brown-floccose; scape-bracts imbricate, ovate becoming glabrous, the lowest few with small spinose serrate blades 12 mm. wide, the highest with long almost filiform blades; inflorescence simple, subdense, 3 dm. long; rhachis slender, flexuous, densely ferruginous-lanate; floral bracts ovate, acuminate, to 6 cm. long, soon glabrous; pedicels arching, ca. 15 mm. long, lanate; flowers secund, reflexed; sepals ovate, acuminate, 35 mm. long, densely ferruginous-lanate, the posterior subcarinate; petals at least 10 cm. long, naked; ovary more than 4/5 superior; ovules caudate. Pl. I, fig. 1: Floral bract and flower x 1/2; fig. 2: Sepal (ventral side) x 1.

Type in the herbarium of the University of Texas, No. 100,067, collected in granitic soil on mountainside beside a swift stream, among mixed pine and cacti, 25 miles south of Chilpancingo, State of Guerrero, Mexico, August 16, 1947, by John B. Paxson, Grady L. Webster and Fred A. Barkley (No. 17-M-819).

VENEZUELA

COTTENDORFIA GRACILLIMA L. B. Smith, sp. nov.

A C. serrulata (L. B. Smith) L. B. Smith, cui affinis, inflorescentiae axibus gracillimis, pedicellis elongatis bracteas florigeras superantibus differt.

Known only in young flower; rhizome very stout, over 3 dm. long; leaves very many, rosulate, forming a bulb ca. 8 cm. in diameter; sheaths orbicular, 5 cm. in diameter, dark castaneous; blades linear, acuminate, pungent, 30 cm. long, 24 mm. wide, about equaling the undeveloped inflorescence, subdensely serrulate throughout, glabrous, coriaceous, rich green, very narrowly yellow-margined; scape erect, slender; scape-bracts erect, densely imbricate, very narrowly triangular, serrulate throughout; inflorescence very laxly bipinnate with very slender axes, subdensely vestite with pale narrow spreading scales; primary bracts like the scape-bracts, much shorter than the branches; branches ascending, to 10 cm. long, not flexuous; floral bracts linear, 2.5 mm. long; pedicels spreading, very slender, 3.5 mm. long; sepals orbicular, 2.5 mm. long. Pl. I, fig. 3: Apex of leaf (ventral side) x 1; fig. 4: Base of branch x 1; fig. 5: Sepal x 2.

Type in the U. S. National Herbarium, No. 2,338,336, collected on moist cliff face, on northeast facing line of sandstone bluffs, northwest slopes of Cerro Venamo, State of Bolívar, Venezuela, altitude 1100 meters, April 21, 1960, by J. A. Steyermark and S. Nilsson (No. 436).

COTTENDORFIA GUIANENSIS (Beer) Kl. ex Baker var. VESTITA L. B. Smith, var. nov.

A var. guyanensis laminis foliorum subtus dense cinereo-lepidotis solum vetustis plus minusve glabrescentibus differt.

Type in the U. S. National Herbarium, No. 2,338,340, collected in swampy savanna in valley of savanna of Río Uarama below Uarama-tepui at km. 150, vicinity of camp 150, northeast of Luepa, State of Bolívar, Venezuela, alt. 1220 m., April 25, 1960, by J. A. Steyermark and S. Nilsson (No. 567).

Paratypes: VENEZUELA: Bolívar: Vicinity of camp 150 at km. 150, in valley of savanna of Río Uarama below Uarama-tepui, northeast of Luepa, alt. 1220 m., April 24, 25, 1960, Steyermark & Nilsson 534 (VEN, US); 625 (VEN).

GUZMANIA STEYERMARKII L. B. Smith, sp. nov.

A G. plumieri (Griseb.) Mez, cui valde affinis, foliis et bracteis primariis inferioribus acuminatis subulato-involutisque, bracteis florigeris orbicularibus obtuse apiculatis, pedicellis brevioribus, sepalis altiore connatis differt.

Flowering 1.4 meters high; leaves rosulate, 6-9 dm. long, pale green, coriaceous, very obscurely punctulate-lepidote on both sides; sheaths inconspicuous, elongate; blades ligulate, acuminate, involute-subulate, pungent, 40-45 mm. wide; scape erect, about equaling the leaves, sparsely pale-flocculose; scape-bracts erect, imbricate and covering most of the scape, the lower foliaceous, the upper narrowly triangular from an ovate base; inflorescence laxly bipinnate, ample, subdensely white-flocculose; primary bracts shorter than the normal branches but equaling or exceeding abortive basal ones, the lower primary bracts like the upper scape-bracts, the upper ones broadly ovate and scarcely larger than the floral bracts; branches spreading, to 12 cm. long, slender, slightly flexuous or curved, laxly and more or less secundly many-flowered, red, the sterile base very short; floral bracts orbicular with a blunt triangular apiculus, 15 mm. long, subchartaceous when dry, nerved, red; pedicels obconic, 4 mm. long; sepals linear-lanceolate, obtuse, 22 mm. long, connate for 6 mm., coriaceous, glabrous; petal-blades broadly elliptic, 5 mm. long, yellow; stamens included, filaments adnate to the corolla-tube. Pl. I, fig. 6: Branch x 1/2; fig. 7: Sepals x 1.

Type in the U. S. National Herbarium, Nos. 2,338,333 to 2,338,335, collected on ground in mossy forest, northwest slopes of Cerro Venamo, State of Bolívar, Venezuela, altitude 1100 m., April 21, 1960, by J. A. Steyermark and S. Nilsson (No. 428).

Paratype: VENEZUELA: Bolívar: On ground, wooded quebrada, headwaters of Río Venamo, west of km. 125, northern slopes of Cerro La Danta, northwest of Cerro Venamo, alt. 1060 m., April 13, 1960, Steyermark & Nilsson 71 (US, VEN).

COLOMBIA

PUYA ALPICOLA L. B. Smith, sp. nov.

A P. gargantae L. B. Smith, cui affinis, inflorescentia ellip-

soidea multo robustiore, bracteis florigeris majoribus, sepalis coriaceis differt.

Flowering over 8 dm. high; leaves to 3 dm. long; sheaths sub-orbicular, 6 cm. wide, white and entire except for the castaneous serrulate apex; blades narrowly triangular, acuminate, 25 mm. wide, densely appressed-cinereous-lepidote on both sides, finally becoming glabrous above, laxly serrate with flat brown straight or slightly curved spines 3 mm. long; scape about 15 mm. in diameter, cinereous-lanate; scape-bracts very densely imbricate, the lowest subfoliaceous, the highest lance-ovate, acuminate, obscurely serrulate, subcoriaceous with thin crisped margins when dry; fruiting inflorescence simple, 25 cm. long, showing vestiges of a dense cinereous tomentum except on the petals; floral bracts like the upper scape-bracts, 8 cm. long, much exceeding the flowers; pedicels obconic, 10 mm. long; sepals lance-oblong, acute, 28 mm. long, coriaceous. Pl. I, fig. 8: Floral bract x 1/2; fig. 9: Old flower x 1/2; fig. 10: Sepal x 1.

Type in the U. S. National Herbarium, Nos. 2,340,736, and 2,340,737, collected on open rocky paramo, Laguna de Calocribe (east of Meollaca), Hoya del Río Donachuí, southeastern slopes of Sierra Nevada de Santa Marta, Department of Magdalena, Colombia, 3600-3700 meters altitude, September 30, 1959, by J. Cuatrecasas (No. 24547).

PUYA GRUBBII L. B. Smith, sp. nov.

A *P. reflexiflora* Mez, cui affinis, laminis foliorum angustioribus subtus obscure lepidotis, sepalis minoribus oblongis differt.

Flowering 1 meter high (! Grubb); leaves 3 dm. long; sheaths inconspicuous, sparsely appressed-lepidote; blades narrowly triangular, acuminate, glabrous above, minutely and obscurely lepidote between the nerves beneath, laxly serrate with slender straight suberect spines 3.5 mm. long; scape ca. 1 cm. in diameter, glabrous; scape-bracts densely imbricate, the lowest foliaceous, the others membranaceous and rapidly deciduous; inflorescence simple, over 3 dm. long, sublax with the rhachis visible throughout, many-flowered, pale-stellate-lepidote except the petals; floral bracts suborbicular, apiculate, distinctly exceeding the pedicels, entire, thin, drying almost black; flowers spreading to reflexed; pedicels slender, curved, to 13 mm. long; sepals oblong, obtuse, 20 mm. long, carinate at base; petals 35 mm. long, greyish green (! Grubb), bearing slight irregular folds at base. Pl. I, fig. 11: Floral bract and flower x 1; fig. 12: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,322,617, collected on broken cliffs by river, below Báchira, Sierra Nevada de Cocuy, Department of Boyacá, Colombia, altitude ca. 2050 meters, August 25, 1957, by P. J. Grubb, B. A. B. Curry, and A. Fernández-Pérez (No. 711).

PUYA ROSEANA L. B. Smith, sp. nov.

A P. glaucovirens Mez, cui affinis, ramis brevioribus densioribus, indumento ferrugineo differt.

Known from a single branch; inflorescence bipinnate, densely ferruginous-tomentose; primary bract imperfect but evidently shorter than the flat 4 cm. long sterile base of the branch; branch spreading, its axis 11 cm. long, visible at base but densely flowered above; floral bracts broadly ovate, apiculate, equaling or shorter than the pedicels; pedicels stout, 10 mm. long; flowers subspreading; sepals oblong, broadly acute or obtuse, 20 mm. long, the posterior ones more or less carinate toward base. Pl. I, fig. 13: Floral bract and old flower x 1.

Type in the U. S. National Herbarium, No. 2,340,469, collected in Ecuador by J. N. Rose (No. 23210-a). The type was mounted on the same sheet as flowering material of Puya thomasiana André and the field notes for No. 23210 give petal color, so the data on the label does not necessarily apply to P. roseana. Rose's specimens of Puya have been mixed considerably before mounting, so all that is reasonably certain is that P. roseana is from Ecuador.

PERU

PUYA MEMBRANACEA L. B. Smith, sp. nov.

A P. compacta L. B. Smith, cui affinis, bracteis primariis orbicularibus apiculatisque, sepalis lanceolatis differt.

Flowering about 1 meter high (! West); leaves 35 cm. long; blades very narrowly triangular, acuminate, rigid, glabrous above, densely and minutely appressed-lepidote beneath, laxly serrate with flat brown mostly retrorse spines 4 mm. long; scape about 1 cm. in diameter at apex, lanate; scape-bracts densely imbricate, the upper with a broad dark brown membranaceous base and linear subfoliaceous blade; inflorescence densely cylindrical, bipinnate, densely pale-brown-lanate except the petals; primary bracts orbicular, apiculate, at least 4 cm. long, entire, pale brown, membranaceous, translucent, becoming more or less glabrous; lateral branches reduced to few-flowered pulvini; floral bracts elliptic, abruptly acuminate, slightly exceeding the sepals, membranaceous; pedicels cylindrical, 6 mm. long; sepals lanceolate, acute, 20 mm. long, ecarinate; petals 35 mm. long, yellowish green (! West), naked. Pl. I, fig. 14: Primary bract and branch x 1/2; fig. 15: Sepal (ventral side) x 1.

Type in the University of California, No. 564,917, collected among rocks, Acanacu Pass, Province of Paucar tambo, Department of Cuzco, Peru, altitude 3600 meters, July 19, 1936, by James West (No. 7032).

PUYA WESTII L. B. Smith, sp. nov.

A P. glaucovirens Mez, cui affinis, bracteis florigeris pedicellos subaequantibus differt.

Flowering 2 meters high (! West); leaves over 1 meter long; blades linear, caudate-acuminate, to 25 mm. wide, covered with

pale appressed scales on both sides but becoming more or less glabrous above, laxly serrate with flat uncinat dark castaneous spines 6-8 mm. long; scape unknown; inflorescence very laxly bipinnate, densely and finely pale-ferruginous-tomentose; axis 17 mm. in diameter near base, red, glabrous with age; primary bracts narrowly triangular, acuminate, 4 cm. long, about equaling the sterile bases of the branches, spinose-serrulate; branches 35-63 cm. long, very laxly many-flowered; floral bracts broadly ovate, about equaling the pedicels; pedicels stout, 10 mm. long; flowers divergent to spreading; sepals oblong, broadly acute or obtuse, 20 mm. long, ecarinate; petals over 4 cm. long, bearing obscure folds at base, rose when dry; stamens equaling the petals but exerted at anthesis by the torsion of the petals; seeds broadly alate. Pl. I, fig. 16: Floral bract and flower x 1/2; fig. 17: Sepal x 1.

Type in the herbarium of the University of California, No. 584,237, collected on rocky slopes, near Huamachuco, Department of Libertad, Peru, altitude 3400 meters, November 26, 1936, by James West (No. 8353).

Paratype: Material apparently cultivated from the type, Huntington Gardens, Pasadena, California, H. E. Moore, Jr. 6454 (US)

TILLANDSIA SOMNIANS L. B. Smith, sp. nov.

T. denudata André in systema Mezii proxima sed foliis vix rigidis, inflorescentia bipinnata, bracteis florigeris acute carinatis, sepalis posticis breviter connatis differt.

Flowering 2 meters high (! West); leaves rosulate, at least 24 cm. long, rather soft, obscurely lepidote; sheaths broadly ovate, 3-4 cm. long, concolorous with the blades; blades ligulate, acuminate and when dry contorted at apex, 2 cm. wide; scape slender, elongate; lower scape-bracts foliaceous, densely imbricate, the upper elliptic, 5-6 cm. long, about equaling the internodes; inflorescence laxly bipinnate, over 2 dm. long, glabrous; rhachis geniculate; primary bracts like the upper scape-bracts, incomplete but probably shorter than the branches; spikes sharply reflexed, linear-lanceolate, acute, over 8 cm. long including the short bracteate sterile base, 15 mm. broad, strongly complanate, densely 12-flowered; floral bracts densely imbricate, lance-oblong, acute, 20 mm. long, equaling or exceeding the sepals, sharply carinate and nearly straight toward apex, coriaceous, even or nearly so; flowers subsessile; sepals lance-oblong, 17 mm. long, posteriorly short-connate. Pl. II, fig. 1: Primary bract and branch x 1/2; fig. 2: Posterior sepals x 1.

Type in the University of California, No. 561,827, collected in moist locations in narrow gulches between cliffs, at head of Quebrada of Atacongo near Lurin, Department of Lima, Peru, altitude 600 meters, October 13, 1935, by James West (No. 3608).

BOLIVIA

PUYA ALATA L. B. Smith, sp. nov.

A *P. smithii* Castellanos, cui affinis, spicis laxissimis,

bracteis primariis minimis integrisque, pedicellis dissite albido-lepidotis, sepalis majoribus differt.

Known only from fragments; leaves over 7 dm. long; blades narrowly triangular, acuminate, pungent, 3 cm. wide, glabrous above, densely vestite beneath and on the margins with pale subappressed scales, laxly serrate with flat antrorse spines 10 mm. long; scape unknown; inflorescence compound; primary bracts elliptic, apiculate, 2 cm. long, shorter than the sterile base of the branch, entire, sparsely and minutely lepidote with fine linear white trichomes; branches slightly flexuous, 3 dm. long, 3 mm. in diameter, very laxly flowered, angled, soon glabrous; floral bracts erect, like the primary bracts, much exceeding the pedicels; pedicels slender, to 10 mm. long, sparsely pale-lepidote; flowers downwardly secund; sepals lanceolate, rounded and apiculate, 26 mm. long, even, soon glabrous, alate-carinate; petals red-purple when dry. Pl. II, fig. 3: Base of branch x 1/2; fig. 4: Sepal x 1.

Type in the Chicago Natural History Museum, No. 754,160, collected on very dry rocky soil, Lagunillas, Valley of Tareira, Department of Potosí, Bolivia, altitude 1000 meters, August 1934, by M. Cárdenas (No. 2851).

PUYA MINIMA L. B. Smith, sp. nov.

A P. tuberosa Mez, cui affinis, foliis scapoque multo minoribus, foliorum lepidibus latis subpatentibus differt.

Flowering only 10 cm. high; leaves forming a subbulbous rosette, to 12 cm. long; sheaths broadly ovate, 15 mm. long, serrulate and appressed-lepidote toward apex, elsewhere entire and glabrous, the outer ones dark brown; blades linear-triangular, acuminate, to 6 mm. wide, covered on both sides with suborbicular slightly spreading cinereous scales, becoming glabrous above, laxly serrate with slender yellow-brown retrorse spines 1.5 mm. long; scape slender, pale-stellate-lepidote, mostly hidden by the leaves; scape-bracts imbricate, the upper ovate, acute, thin; inflorescence simple, 4 cm. long, subdense, few-flowered, sparsely pale-stellate-lepidote except the petals; floral bracts like the upper scape-bracts, to 13 mm. long, much exceeding the pedicels, bright red (! West); pedicels slender, to 8 mm. long; sepals oblong, broadly acute and apiculate, 11 mm. long; petals ca. 15 mm. long, naked. Pl. II, fig. 5: Floral bract and flower x 1; fig. 6: Sepal x 1.

Type in the University of California, No. 578,745, collected on bare gravelly ground of rocky grass- and brush-grown slopes, within the more or less permanent cloudbelt from about 2500 m. to top of Sama grade (east side), Cuesta de Sama, 30-35 km. northwest of Tarija, Province of Tarija, Bolivia, February 12, 1937, by James West (No. 8345).

PUYA POTOSINA L. B. Smith, sp. nov.

A P. hofstenii Mez, cui affinis, pedicellis multo majoribus bracteis florigeras subduplo superantibus differt.

Known only from fragments; leaves over 5 dm. long; blades very

narrowly triangular, caudate-acuminate, 25 mm. wide, densely pale-appressed-lepidote on both sides but becoming more or less glabrous above, laxly serrate with brown uncinat antrorse spines 3 mm. long; scape 8 mm. in diameter at apex, glabrous; scape-bracts small and exposing most of the upper scape, the ovate serrulate base 2 cm. long, the slender linear blade over 5 cm. long; inflorescence laxly bipinnate, 7 dm. long (! Cárdenas), glabrous, somewhat glaucous; primary bracts like the upper scape-bracts but with much shorter blades or merely apiculate, about equaling the sterile base of the branch; branches suberect, nearly straight, to 25 cm. long, 4 mm. wide at the flattened base, lax; floral bracts ovate, apiculate, to 15 mm. long, entire, thin; pedicels slender, enlarged upward, to 30 mm. long; flowers more or less secund, often subverticillate; sepals lanceolate, rounded and apiculate, 21 mm. long, carinate at base, sulcate when dry; petals 4 cm. long, naked; stamens included. Pl. II, fig. 7: Floral bract and flower x 1/2; fig. 8: Sepal x 1.

Type in the U. S. National Herbarium, No. 1,909,502, collected on dry slate slopes, Quechisla, Department of Potosí, Bolivia, altitude 3400 meters, December 1946, by M. Cárdenas (No. 3738).

PUYA RIPARIA L. B. Smith, sp. nov.

Ab omnibus speciebus adhuc cognitis, inflorescentia ex sicco nigra dense albido-lanata, spicis laxis, bracteis florigeris sepalisque magnis differt.

Flowering about 1.5 meters high; leaves over 5 dm. long; sheaths suborbicular, 6 cm. wide, glabrous, dark castaneous, lustrous, serrulate at apex; blades narrowly triangular, about 2 cm. wide, glabrous above, covered beneath with a layer of cinereous scales, laxly serrate with slender pale uncinat mostly antrorse spines 4-5 mm. long; scape 2 cm. in diameter near base, soon glabrous except the nodes; scape-bracts deciduous, unknown; inflorescence laxly bipinnate, narrowly pyramidal, 7 dm. long, drying black, densely white-lanate; primary bracts ovate, acute, ample, much exceeding the short flat sterile bases of the branches, thin coriaceous, becoming glabrous, the margins crisped when dry; lateral branches few, basal, 10-15 cm. long, lax, their floral bracts shorter than the sepals; terminal branch elongate with floral bracts the size of the primary bracts and much exceeding the sepals; pedicels rather stout, to 20 mm. long; flowers more or less secund; sepals lance-elliptic, apiculate, 42 mm. long, dull and rather rugose on drying; petals over 6 cm. long. Pl. II, fig. 9: Floral bract and flower x 1/2; fig. 10: Sepal (ventral side) x 1.

Type in the U. S. National Herbarium, Nos. 1,985,838 to 1,985,840, collected on rock walls by brook (photograph), on the road to Hacienda Chaco, eastern Cordillera, Bolivia, altitude 1350 meters, November 20, 1948, by Mulford B. Foster (No. 2578).

PUYA SECUNDA L. B. Smith, sp. nov.

A *P. stenothyrsa* (Baker) Mez, cui affinis, bracteis primariis quam ramorum basibus sterilibus brevioribus, floribus secundis,

bracteis florigeris brevibus differt.

Flowering 1-2 meters high (! Cárdenas); leaves over 7 dm. long; blades narrowly triangular, caudate-acuminate, 35 mm. wide, glabrous above, covered beneath with coarse subappressed whitish scales, laxly serrate with flat uncinata antrorse spines 10 mm. long; scape 2 cm. in diameter, densely and finely pale-flocculose; scape-bracts densely imbricate, the lower foliaceous, the upper acuminate from a broadly ovate base, serrulate, red; inflorescence laxly bipinnate, at first finely white-flocculose; primary bracts like the upper scape-bracts, much shorter than the long sterile bases of the branches; branches divergent, 15-30 cm. long, subdensely secund-flowered with the slender rhachis covered toward apex; floral bracts ovate, acuminate, 20-25 mm. long, about equaling the middle of the sepals, rather thin, red, obscurely serrulate, soon glabrous; pedicels slender, 5-10 mm. long; sepals linear-lanceolate, very narrowly obtuse and apiculate, 28 mm. long, ecarinate, soon glabrous; petals dark violet (! Cárdenas). Pl. II, fig. 11: Floral bract and flower x 1/2; fig. 12: Sepal (ventral side) x 1.

Type in the U. S. National Herbarium, No. 1,986,192, and 1,986,193, collected between Aguirre and Incachaca, Chapare, Department of Cochabamba, Bolivia, altitude 2000 meters, November 1948, by M. Cárdenas (No. 4381).

Paratype: BOLIVIA: Cochabamba: Semi-cloud forest above Yungas, eastern slope of Andes, alt. 3000 m., November 13, 1948, M. B. Foster 2550 (US).

BOLIVIA and ARGENTINA

PUYA HOFSTENII Mez, Fedde Rep. Spec. Nov. 3:8. 1906.

Puya hauthalii Mez, Fedde Rep. Spec. Nov. 16:65. 1919.

BOLIVIA: Potosí: Tala Chorolque near Guadalupe, Hauthal 101 (B, type of Puya hauthalii Mez, F photo 11402).

ARGENTINA: Jujuy: Dry slopes near Yavi, alt. 3400 m., Hofsten 1710 (B, type, F photo 11405).

Supposedly, appendaged petals and acuminate sepals distinguished Puya hauthalii from P. hofstenii, but petal-appendages by themselves have proved an unreliable character outside of Chile and Macbride's photograph of P. hauthalii plainly shows apiculate sepals.

CULTIVATION

PUYA HORTENSIS L. B. Smith, sp. nov.

A P. meziana Wittm., cui affinis, spicis laxioribus, bracteis florigeris aequalibus, infimis haud amplis et sepala occultantibus differt.

Known only from fragments but undoubtedly flowering 1-2 meters high; leaves 6-7 dm. long; sheaths reniform, 12 cm. wide, dark castaneous, glabrous except at apex; blades narrowly triangular, acuminate, pungent, to 70 mm. wide, pale-appressed-lepidote on both sides, becoming more or less glabrous, laxly serrate with

slender brown uncinata spines 7 mm. long; scape unknown; inflorescence laxly bipinnate, finely pale-tomentose-lepidote, primary bracts elliptic, caudate-apiculate, 11 cm. long, much exceeding the sterile naked base of the branches, serrulate; branches divergent, straight, to 34 cm. long, rather laxly flowered with the rhachis wholly visible at anthesis; floral bracts uniform, lanceolate, apiculate, to 35 mm. long, reaching about the middle of the sepals, thin; pedicels slender, to 30 mm. long, persistently lepidote and contrasting with the glabrescent sepals; sepals lanceolate, rounded and apiculate, 27 mm. long, ecarinate, sulcate when dry; petals over 7 cm. long, naked, red-purple when dry; stamens included. Pl. II, fig. 13: Floral bract and flower x 1/2; fig. 14: Sepal x 1.

Type in the U. S. National Herbarium, No. 2,053,883, collected from cultivated material of unknown origin at the Huntington Gardens, Pasadena, California, June 7, 1952, by H. E. Moore, Jr. (No. 6448). US 2,095,140, paratype from the Huntington Gardens collection (No. 36-39). US 2,252,224, paratype labeled with data and number (West 6479) belonging to Puya longistyla Mez, and from now on cited as West 6479-a. The origin of the plant thus remains a mystery, although it is possible that it was collected in Peru or Bolivia by the Goodspeed Expedition. West 6479-a is the best material but because of the label confusion it seems well not to choose it as the type.

NOTE

The eleven new species of Puya described above are the result of a preliminary revision of the genus in preparation of a monograph of the Bromeliaceae. It is not worthwhile to publish the key in its present rough form, but it is available for consultation. The recognizable species of Puya now number 138.

Plate I

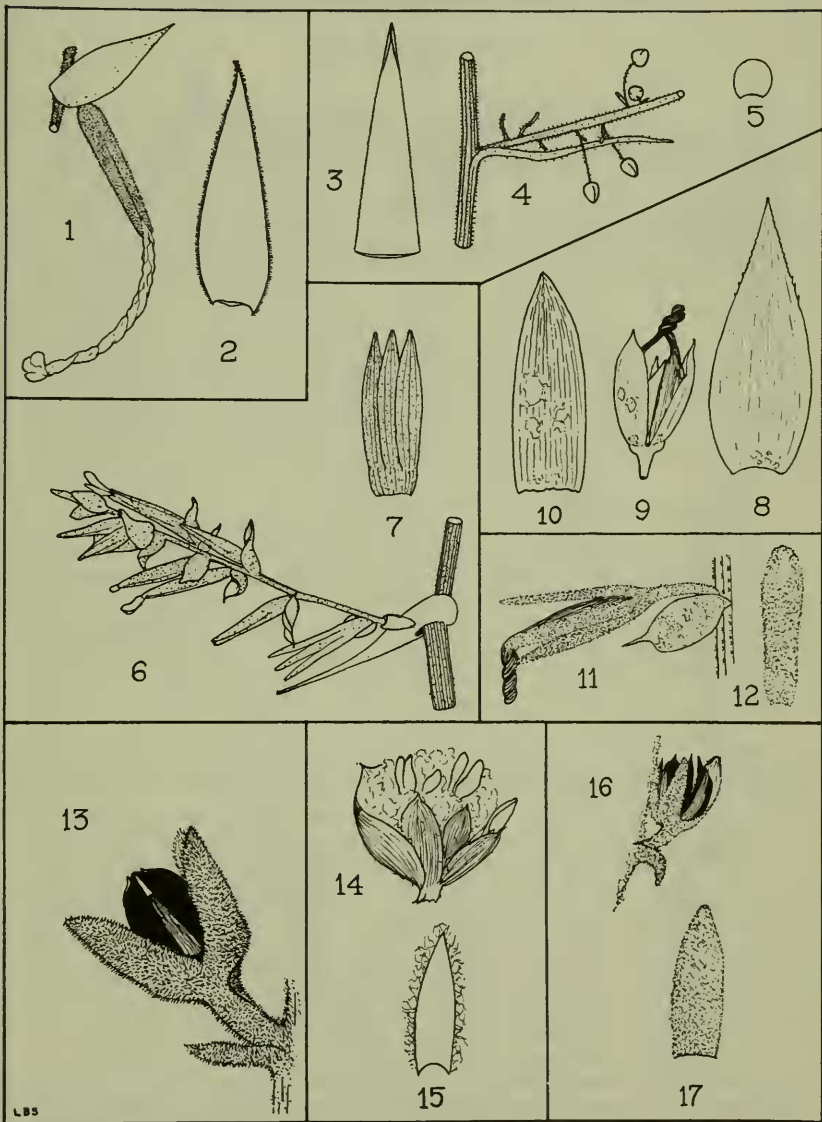


Fig. 1, 2: *Pitcairnia modesta*; fig. 3-5: *Cottendorfia gracillima*;
 fig. 6, 7: *Guzmania steyermarkii*; fig. 8-10: *Puya alpicola*;
 fig. 11, 12: *Puya grubbii*; fig. 13: *Puya roseana*; fig.
 14, 15: *Puya membranacea*; fig. 16, 17: *Puya westii*.

Plate II

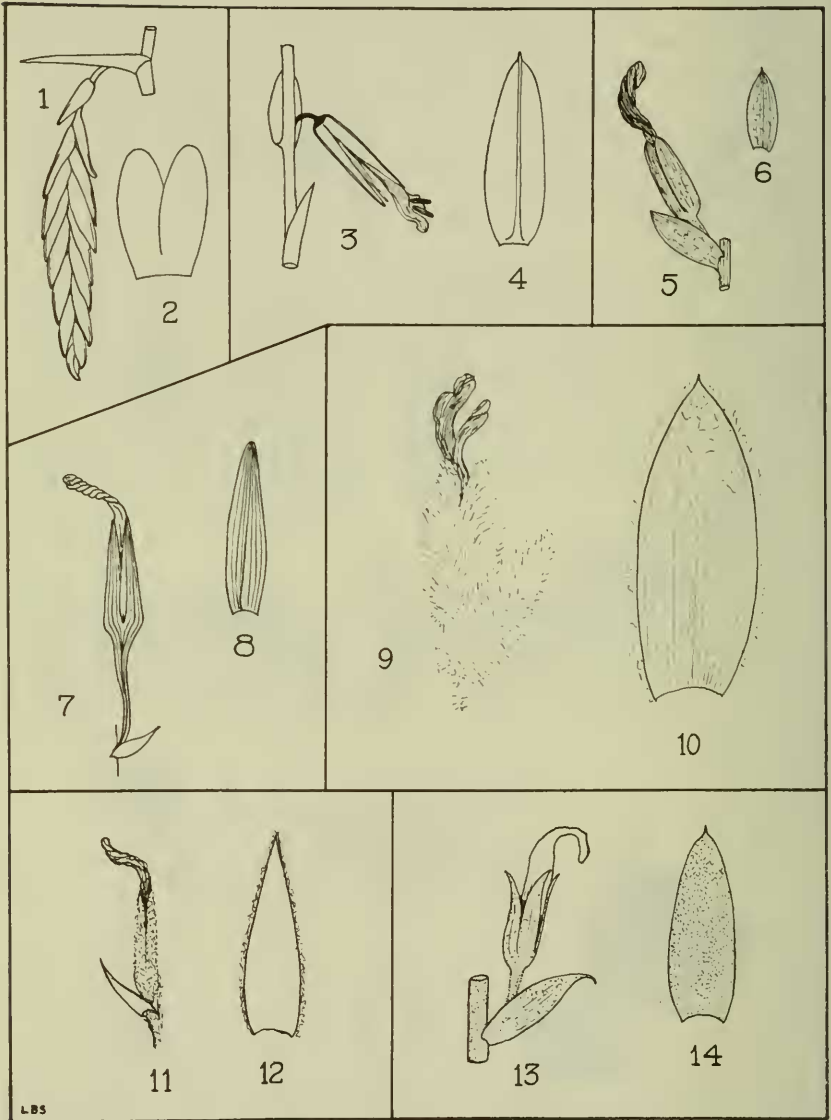


Fig. 1, 2: *Tillandsia sommians*; fig. 3, 4: *Puya alata*; fig. 5, 6: *Puya minima*; fig. 7, 8: *Puya potosina*; fig. 9, 10: *Puya riparia*; fig. 11, 12: *Puya secunda*; fig. 13, 14: *Puya hortensis*.